U.S. Application No.: 10/561,973

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (withdrawn) A compound represented by formula (I)

wherein A is a cyclic group which may have a substituent(s);

X, Y and Z are each independently a single bond or a spacer of which main chain has an atom number of 1-3; and

B is a hydrocarbon group which may have a substituent(s) or a cyclic group which may have a substituent(s).

a salt thereof, an N-oxide thereof, a solvate thereof or a prodrug thereof.

 (withdrawn) The compound according to claim 1, which is represented by formula (I-1)

$$A^1$$
N $-X-Y-Z-B$ (I-1)

wherein ring A^1 is a di-, tri-, or tetra-nitrogen-containing heterocyclic ring, the other symbols have the same meanings as those defined in claim 1, and wherein ring A^1 is not 2,3,4,5-tetrahydro-1H-1-benzazepine, 1,2,3,4,5,6-hexahydro-1-benzazepine, 2,3,4,5-tetrahydro-1,5-benzoxazepine, 6,7,8,9-tetrahydro-5H-pylid[2,3-d]azepine or 5,6,7,8-tetrahydro-4H-thieno[3,2-d]azepine.

- (withdrawn) The compound according to claim 2, wherein ring A¹ is a tri-, or tetra-nitrogen-containing heterocyclic ring.
- (withdrawn) The compound according to claim 3, which is represented by formula (I-2)

$$(R^1)_t$$
 $(R^1)_s$
 A^3
 A^3
 A^3
 A^3
 A^4
 A^2
 A^2
 A^3
 A^3
 A^4
 A^2
 A^3
 A^4
 A^2
 A^3
 A^4
 $A^$

wherein ring ${\boldsymbol{A}}^2$ is a mono-nitrogen-containing heterocyclic ring;

 $\mbox{ring}\,A^3$ is a mono-carbocyclic ring or mono-heterocyclic ring;

plural R¹s are each independently a substituent, and when R¹s are plural, two R¹s may be together to form cyclic group which may have a substituent(s);

R² is a hydrogen atom or a substituent;

t and s are each independently 0 or an integer of 1-5, and the sum of t and s is 5 or less;

J¹ is a single bond, a carbon atom which may have a substituent(s), a nitrogen atom which may have a substituent(s), an oxygen atom or a sulfur atom which may be oxidized;

J², J³, J⁴ and J⁵ are each independently a carbon atom or a nitrogen atom,

---- is a single bond or a double bond, and

the other symbols have the same meanings as those defined in claim 1.

5. **(withdrawn)** The compound according to claim 4, which is represented by formula (I-3)

$$(R^{1})_{t}$$
 A^{3} N $N = X^{1} - Y^{1} - Z^{1} - B$ $(1-3)_{t}$ R^{2} A^{4}

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wherein R³, R⁴, R⁵, R⁶ and R⁷ are each independently a hydrogen atom or a substituent, and R⁴ and R⁵, and/or R⁶ and R⁷ may be together with their binding carbon atom to form a cyclic group which may have a substituent(s);

ring A4 is a cyclic group which may have a substituent(s);

 X^1 and Z^1 are each independently a single bond, C1-3 alkylene which may have a substituent(s), C2-3 alkenylene which may have a substituent(s) or C2-3 alkynylene which may have a substituent(s);

 Y^1 is -C(=0)-, -C(=S)-, -C(=0)NR¹⁰³-, -SO₂-, -C(=0)O- or SO₂NR¹⁰³-, in which R¹⁰³ is a hydrogen atom or a substituent,

the sum of the number of substituents represented by R^{1} , R^{3} , R^{4} , R^{5} , R^{6} and R^{7} is 4 or less, and

the other symbols have the same meanings as those defined in claim 1.

- 6. (withdrawn) The compound according to claim 5, wherein R⁴ and R⁵ are simultaneously substituents, or R⁴ and R⁵ are together with their binding carbon atom to form a cyclic group which may have a substituent(s).
- 7. (withdrawn) The compound according to claim 5, wherein \mathbb{R}^3 is a substituent.

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8. (withdrawn) The compound according to claim 5, wherein R⁶ and R⁷ are simultaneously substituents, or R⁶ and R⁷ are together with their binding carbon atom to form a cyclic group which may have a substituent(s).

- (withdrawn) The compound according to claim 5, wherein R³ is a monoheterocyclic ring.
- 10. (withdrawn) The compound according to claim 5, wherein B is a C3-10 mono-, or di-carbocyclic ring which may have a substituent(s) or a 3-10 membered mono-, or di-heterocyclic ring which may have a substituent(s).
- 11. (withdrawn) The compound according to claim 5, wherein ring A⁴ is a C3-10 mono-, or di-carbocyclic ring which may have a substituent(s) or a 3-10 membered mono-, or di-heterocyclic ring which may have a substituent(s).
- 12. (withdrawn) The compound according to claim 5, wherein Y^1 is -C(=0) or -C(=0)NR¹⁰³.

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- 13. (withdrawn) The compound according to claim 4, which is selected from
- (1) N-(3,5-dimethylphenyl)-1,3,4,9-tetrahydro-2H- β -carboline-2-carboxamide,
 - (2) N-(3-methylphenyl)-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide,
- (3) N-(3,5-dimethylphenyl)-6-methoxy-1,3,4,9-tetrahydro-2H- β -carboline-2-carboxamide.
- (4) 6-methoxy-N-(3-methylphenyl)-1,3,4,9-tetrahydro-2H- β -carboline-2-carboxamide,
- (5) 6-methoxy-N-[2-(trifuloromethyl)phenyl]-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide.
- (6) N-(3,5-dichlorophenyl)-6-methoxy-1,3,4,9-tetrahydro-2H- β -carboline-2-carboxamide,
- (7) 1-(3-fluorophenyl)-N-phenyl-1,3,4,9-tetrahydro-2H- β -carboline-2-carboxamide.
- (8) 1-(3-fluorophenyl)-N-(3-methylphenyl)-1,3,4,9-tetrahydro-2H- β -carboline-2-carboxamide,
- (9) N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide.
 - (10) 2-acetyl-1-(3-fluorophenyl)-2,3,4,9-tetrahydro-1H-β-carboline,

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- (11) 2-({[5-(trifluoromethyl)pyridin-2-yl]thio}acetyl)-2,3,4,9-tetrahydro-1H-β-carboline.
 - (12) 2-{[(2,5-dimethoxyphenyl)thio]acetyl}-2,3,4,9-tetrahydro-1H-β-carboline,
- (13) 6-methoxy-1-(trifluoromethyl)-2-({[5-(trifluoromethyl)pyridin-2-yl]thio}acetyl)-2,3,4,9-tetrahydro-1H- β -carboline,
- (14) 2-{[(2,5-dimethoxyphenyl)thio]acetyl}-6-methoxy-1-(trifluoromethyl)-2,3,4,9-tetrahydro-1H-β-carboline,
- (15) 6-methoxy-N-(3-methylphenyl)-1-(trifluoromethyl)-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide,
- (16) N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-1,9-dihydrospiro[β-carboline-4,1'-cyclopropane]-2(3H)-carboxamide,
- (17) rac-(1R,3S)-N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-3-methyl-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide,
- (18) rac-(1R,3R)-N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-3-methyl-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide,
- (19) N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-6-(trimethylsilyl)-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxamide,
- (20) N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-4,4-dimethyl-1,3,4,9-tetrahydro-2H-8-carboline-2-carboxamide.

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(21) 2-acetyl-1-(3-fluorophenyl)-1,2,3,9-tetrahydrospiro[β-carboline-4,1'-cyclopropane],

- (22) 2-(benzylsulfonyl)-1-(3-fluorophenyl)-2,3,4,9-tetrahydro-1H-β-carboline,
- (23) rac-(1R,3R)-2-acetyl-1-(3-fluorophenyl)-3-methyl-2,3,4,9-tetrahydro-1Hβ-carboline,
- (24) methyl 1-(3-fluorophenyl)-3,3-dimethyl-1,3,4,9-tetrahydro-2H-β-carboline-2-carboxylate, and
- (25) N-(3,5-dimethylphenyl)-8-(3-fluorophenyl)-5,6,8,9-tetrahydro-7Hpyrido[4',3':4,5]pyrrolo[2,3-b]pyridine-7-carboxamide.
- (previously presented) A pharmaccutical composition comprising the compound represented by formula (I) according to claim 23, a salt thereof,
- (currently amended) The pharmaceutical composition according to claim 14, which is a preventive-and/or-therapeutic agent for a mitochondrial benzodiazepine receptor mediated disease.

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16. (original) The pharmaceutical composition according to claim 15, wherein the mitochondrial benzodiazepine receptor mediated disease is a disease caused by stress.

- 17. (original) The pharmaceutical composition according to claim 16, wherein the disease caused by stress is a central nervous system disease caused by stress, a respiratory system disease caused by stress and/or a digestive system disease caused by stress.
- 18. (original) The pharmaceutical composition according to claim 17, wherein the central nervous system disease caused by stress is anxiety-related disease, sleep disorder, depression and/or epilepsy; a respiratory system disease caused by stress is asthma; or the digestive system disease caused by stress is irritable bowel syndrome.
- 19. (withdrawn) A method for prevention and/or treatment for a central nervous system, a respiratory system disease and/or a digestive disease in mammals, comprising administering to a mammal an effective amount of the compound represented by formula (I) according to claim 1, a salt thereof, an N-oxide thereof, a solvate thereof or a prodrug thereof.

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20. (withdrawn) A pharmaceutical composition combining the compound represented by formula (I) according to claim 1, a salt thereof, an N-oxide thereof, a solvate thereof or a prodrug thereof, and one kind or more kind selected from antianxiety drugs, antidepressant drugs, antiparkinson drugs, therapeutic drugs for schizophrenia, antiepileptic drugs, therapeutic drugs for asthma, therapeutic drugs for peptic ulcer, adjustive drugs for gastrointestinal function, antidiarrheals, evacuants, antihypertensive drugs, antiarrhythmic drugs, inotropic drugs and therapeutic drugs for urination disorder.

21. (withdrawn) A method for prevention and/or treatment for a mitochondrial benzodiazepine receptor mediated disease in mammals, which comprises administering to a mammal an effective amount of the compound represented by formula (I) according to claim 23, a salt thereof, an N-oxide, a solvate or a prodrug thereof.

22. (canceled)

23. (currently amended): A compound represented by formula (I-3-4):

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wherein.

ring A³ is benzene, pyridine, pyrimidine or pyrazine;

ring A⁴ is benzene which may be substituted with 1 to 4 substituent(s) optionally selected from C1-8 alkyl, C2-8 alkenyl, C2-8 alkynyl, a carbocyclic ring, a heterocyclic ring, hydroxyl, C1-8 alkoxy, amino, NR¹⁰⁴R¹⁰⁵, carboxyl, C1-6 alkoxycarbonyl, nitro, cyano, a halogen atom, oxo, acyl, formyl and tri(C1-6 alkyl)silyl;

R¹⁰⁴ and R¹⁰⁵ are each independently a hydrogen atom or C1-8 alkyl;

R¹ is C1-8 alkyl, C2-8 alkenyl, C2-8 alkynyl, -a -earboeyelie ring which may have a substituent(s), a heteroeyelie ring which may have a substituent(s), hydroxyl, C1-8 alkoxy, mercapto, C1-8 alkylthio, amino, NR ¹⁰⁴R ¹⁰⁵, carboxyl, C1-6 alkoxycarbonyl, nitro, cyano, a halogen atom, oxo, acyl, formyl or tri(C1-6 alkyl)silyl;

 $\boldsymbol{R}^2,\boldsymbol{R}^3,\boldsymbol{R}^6$ and \boldsymbol{R}^7 represent a hydrogen atom ;

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R⁴ and R⁵ are together with their binding carbon atom to form C3-8 cycloalkyl-which may be substituted with 1 to 4 substituent(s) optionally selected from C1-8 alkyl, C2-8 alkenyl, C2-8 alkynyl, a carbocyclic ring, a heterocyclic ring, hydroxyl, C1-8 alkoxy, amino, NR¹⁰⁴R¹⁰⁵; carboxyl, C1-6 alkoxycarbonyl, nitro, cyano, a halogen atom, oxo, acyl, formyl and tri(C1-6 alkyl)silyl;

X1 and Z1 represent a single bond;

$$Y^{1}$$
 is -C(=O)-, -C(=O)NR¹⁰³-, [[-,]] -SO₂-, -C(=O)O- or SO₂NR¹⁰³;

R103 is a hydrogen atom;

B is C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl which may be substituted with 1 to 4 substituent(s) optionally selected from hydroxyl, mercapto, amino, carboxyl, nitro, cyano, monoor di-C1-6 alkylamino, C1-6 alkoxy, C1-6 alkylcarbonyloxy, C1-6 alkylthio, a halogen atom, acyl, or benzene which may be substituted with 1 to 4 substituent(s) optionally selected from C1-8 alkyl, C2-8 alkenyl, C2-8 alkynyl, a-earboeyelie ring, a-heteroeyelie ring, hydroxyl, C1-8 alkoxy, amino, NR 104R 105, carboxyl, C1-6 alkoxycarbonyl, nitro, cyano, a halogen atom, oxo, acyl, formyl and tri(C1-6 alkyl)silyl; and

t is 0 or an integer 1 to 5, a salt thereof[[,]].

(previously presented): The compound according to claim 23, wherein ring A³ is a benzene: Y¹ is -C(=O)- or -C(=O)NR¹⁰³-.

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 (previously presented): The compound according to claim 23, which is selected from

(1) N-(3,5-dimethylphenyl)-1-(3-fluorophenyl)-1,9-dihydrospiro[β-carboline-4,1'-

cyclopropane]-2(3H)-carboxamide, and

(2) 2-acetyl-1-(3-fluorophenyl)-1,2,3,9-tetrahydrospiro[β-carboline-4,1'-cyclopropane].

26. (new) A method for treatment for a mitochondrial benzodiazepine receptor

mediated disease in a mammal, which comprises administering an effective amount of the

compound represented by formula (I-3-4) according to claim 23, or a salt thereof, to a mammal

in need thereof.

27. (new) The method according to claim 26, wherein the a mitochondrial

benzodiazepine receptor mediated disease is a disease caused by stress.

28. (new) The method according to claim 27, wherein the disease caused by stress is

a central nervous system disease caused by stress, a respiratory system disease caused by stress

and/or a digestive system disease caused by stress.

29. (new) The method composition according to claim 28, wherein the central

nervous system disease caused by stress is anxiety-related disease, sleep disorder, depression

and/or epilepsy; a respiratory system disease caused by stress is asthma; or the digestive system

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disease caused by stress is irritable bowel syndrome.